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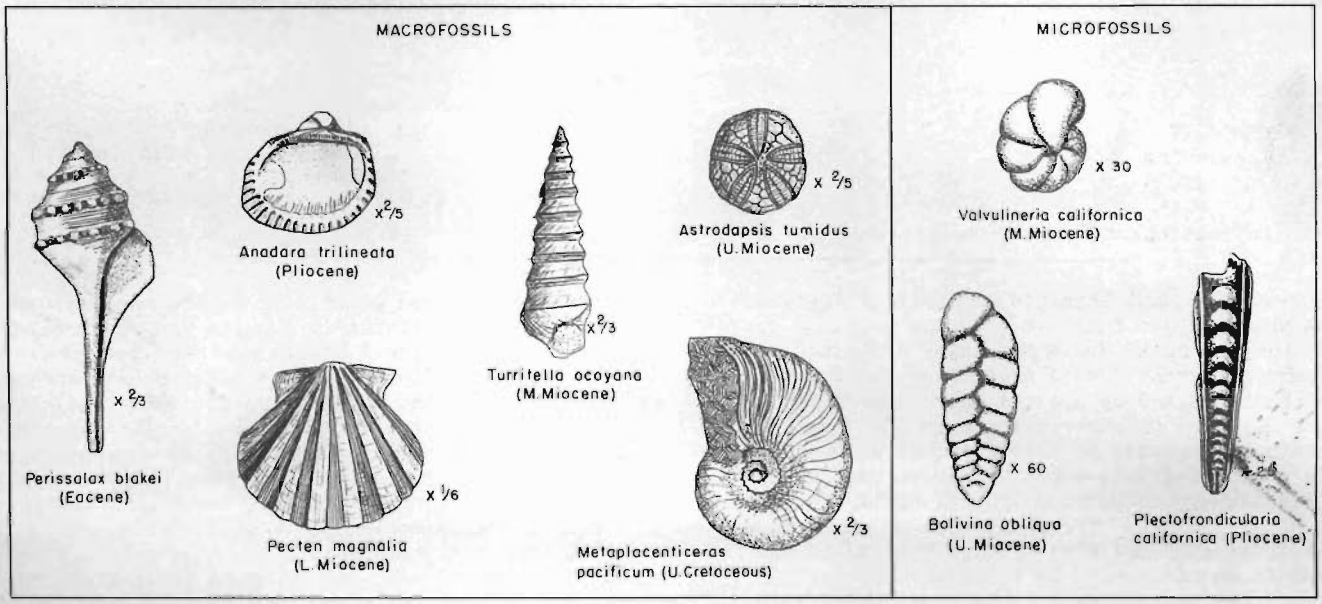
USE OF FOSSILS IN GEOLOGIC EXPLORATION

Paleontology is no longer a science confined to textbooks and museums. Although it started many years ago as a study with no goal other than learning for learning's sake, today it has become a practical and valuable tool in the never-ending search for the earth's mineral resources.

J.W. Powell, the second director of the U.S. Geological Survey, clearly outlined the scope of paleontology as follows:

"Paleontology, the science of fossils, is the geologist's clock, by which he determines the times in earth history when the beds containing the fossils were deposited. Geological time is divided into periods which are characterized by the existence of certain plants and animals. Without paleontology the geologic classification of formations, their correlation, and the determination of their mutual relations would be impossible. In fact, real and symmetrical progress in geology would be impossible without corresponding interrelated development and refinement in its handmaid, paleontology. The study of the economic geology of any region of complicated structure is blind and inconsequent unless the time relations are known. These relations are indicated by the fossils which the strata contain."

Development of Geologic Time Scale. Early in the nineteenth century, while supervising work on canal excavations, William Smith, an English surveyor, made detailed notes on the succession and nature of the rocks he encountered. He noticed that fossils found in a certain rock layer were apparently char-



The fossils shown above are examples of "index fossils". An index fossil is found only in beds formed during a certain time interval. If one of them is found in a rock stratum, the stratum can be dated. In the illustration above, the scientific name of the fossil and the time interval it indicates are given.